



PELVICON 2024

Post-Con 2024

**Menopause Mastery
For Pelvic Rehab Providers**

Michelle Lyons

POST-CON '24



Michelle Lyons

Michelle is a global educator and activist and three-time PelviCon speaker.

She has presented at CSM, ICS, IPPS, British Pelvic Floor Society, and many more conferences and teaching opportunities around the world.

Michelle was an expert contributor for FIFA's 2023 Female Athlete Snapshot. She consults with Sport Ireland and the Irish Martial Arts Commission.

Celebrate Muliebriety


Michelle is the founder of Celebrate Muliebriety, where she hosts her online courses, and the Celebrate Muliebriety podcast. You can find her at

www.celebratemuliebriety.com || [@CelebrateMuliebriety](https://www.instagram.com/CelebrateMuliebriety)

**Menopause Mastery
For Pelvic Rehab Providers**




Menopause Mastery
Michelle Lyons

About Me

- Graduate of UCD's School of Physiotherapy
- Postgraduate in Botanical & Herbal Medicine (University of Arizona)
- Postgraduate in Health Coaching & Nutrition (University of Galway)
- Teacher training qualifications in yoga, pilates & mindfulness
- Instagram: michellelyons_muliebrity




Financial Disclosures

- Owner/Operator at CelebrateMuliebrity.com:
- Online/ Live Continuing Education in Women's Health
- Other affiliations include:
- FIFA
- Sport Ireland
- Pelvic Health Solutions





Why are we here? What matters?

- What is Menopause?
- Hormones & Why They Matter!
- Signs, Symptoms & Differential Diagnosis
- How did we get here? Menstrual & Maternal considerations - from REDs to GSL
- What does it mean for pelvic health & rehab?
- Muscles, tendons & bones at Menopause
- Specific Pelvic Health Issues: bladder, bowel, prolapse, sex, pain
- Is there any evidence for our role?
- Is vaginal oestrogen safe?
- What's the best exercise at menopause?
- And more...



The Key Clinical Takeaways for Today

- There's more to the successful management of menopause than hormone therapy/ anti-depressants
- Pelvic Rehab is an essential component in the management of GSM
- Strength training is non-negotiable
- Knowledge is Power!



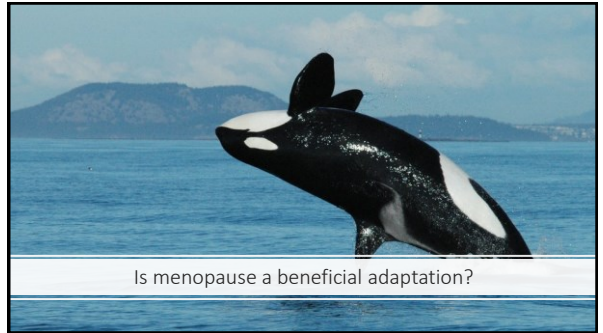
What's Happening Hormonally at Menopause?



• Perimenopause can be confusing...



WTF IS HAPPENING?!
PERIMENOPAUSE!
 WHEN DID IT BEGIN?
WE DON'T KNOW!
 WHEN WILL IT END?
WE ALSO DON'T KNOW!
 HOW WILL IT AFFECT ME?
AGAIN, UNCLEAR!
 WILL THE WORLD ACKNOWLEDGE IT?
NO! YES! (BUT IT'S
 UP TO US TO TALK ABOUT IT!)

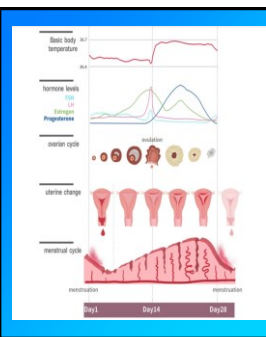


Is menopause a beneficial adaptation?

Ovarian failure vs penile failure...

Where do we start?

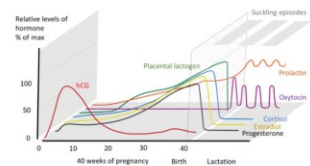
- Peri-Menopause
- Menopause
- Post-Menopause
- **Most of the symptoms we associate with menopause are to do with stopping ovulation**



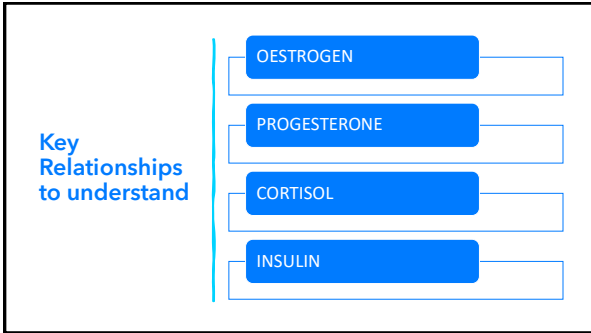
Review of ovulation

- Menstruation
- Early Follicular Phase
- Ovulation
- Luteal Phase
- Menstruation

Postnatal Hormones



Source: David R. Grattan, Sharon R. Ladyman, Chapter 2 - Neurophysiological and cognitive changes in pregnancy, Handbook of Clinical Neurology, Volume 171, 2020, Pages 25-55.




Oestrogens

- Oestradiol
- Oestrone
- Oestriol
- Phytoestrogens
- Xenoestrogens



Progesterone

- Progesterone prepares the endometrium for the potential of pregnancy after ovulation. It triggers the lining to thicken to accept a fertilized egg. It also prohibits the muscle contractions in the uterus that would cause the body to reject an egg. Influences SM relaxation in pregnancy
- Works to balance oestrogen
- Important for mood and sleep....
- Starts to taper off at peri-menopause



Testosterone




In women's bodies, testosterone is produced in the ovaries, adrenal glands, fat cells, and skin cells.

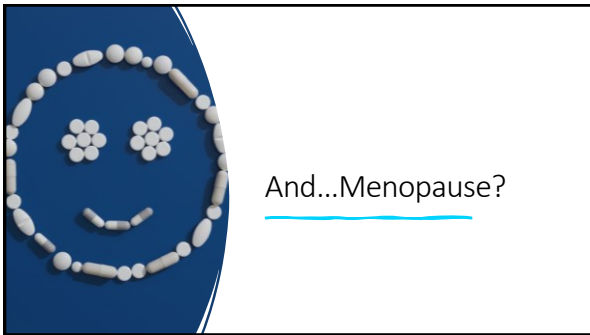
Generally, women's bodies make about 1/10th to 1/20th of the amount of testosterone as men's bodies.

What does testosterone do?

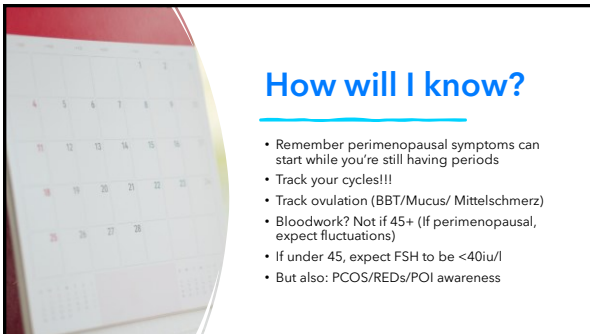
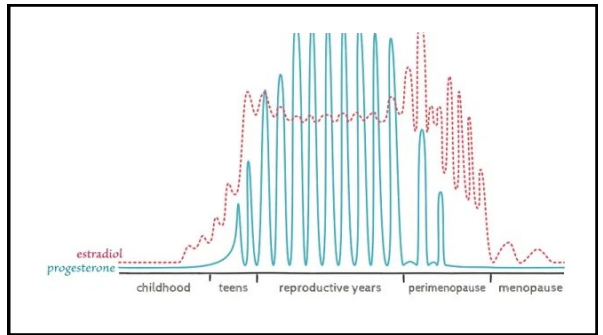
- musculoskeletal health
- breast health
- fertility
- sex drive**
- menstrual health
- vaginal health
- brain health/cognitive function

What influences testosterone?

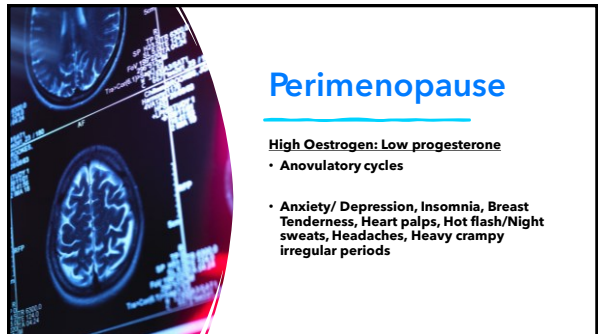


And...Menopause?



How will I know?

- Remember perimenopausal symptoms can start while you're still having periods
- Track your cycles!!!
- Track ovulation (BBT/Mucus/ Mittelschmerz)
- Bloodwork? Not if 45+ (If perimenopausal, expect fluctuations)
- If under 45, expect FSH to be <40iu/l
- But also: PCOS/REDS/POI awareness



Perimenopause

High Oestrogen: Low progesterone

- Anovulatory cycles
- Anxiety/ Depression, Insomnia, Breast Tenderness, Heart palps, Hot flash/Night sweats, Headaches, Heavy crampy irregular periods

Late Perimenopause/ Menopause

[RESEARCH REPORT]

Chronic Plantar Heel Pain Is Principally Associated With Waist Girth (Systemic) and Pain (Central) Factors, Not Foot Factors: A Case-Control Study

Low Oestrogen/ Low Progesterone

Insomnia, Musculoskeletal Issue, Arterial Stiffening, GSM, Brain Fog,

Insulin Resistance: weight gain, belly fat, inflammatory state eg shoulders, hips, feet...

Will it be awful?

- How were your menstrual cycles?
- Anxiety and depression go up at perimenopause, due to disturbances of the HPA Axis (Gordon et al 2015)
- But..
- 'Women report feeling pretty fantastic after menopause' Futurity report 2017
- And...
- Women in their 70's are likeliest to be their happiest ever! (Pipher 2019)

What about hormone therapy?

True or False?

Hormone Therapy is good for prevention?

Use them only for symptom relief?

Take the lowest dose for the shortest time?

Take them forever?

What about...

Bioidentical, Body Identical, Conjugated Equine Oestrogens?

Oral/Systemic vs Transdermal?

Topical Oestrogen for GSM?

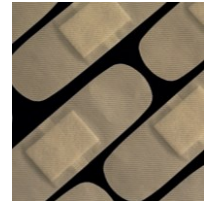
Breast Cancer?



So when we switch from estradiol to estrone...

'Measuring bothersome menopausal symptoms: development and validation of the MenoScores questionnaire' Lund et al 2018

- Around 75% of menopausal women experience hot flushes and 10-20% of postmenopausal women find these symptoms very bothersome.
- Some women also experience night sweats, emotional vulnerability, sleeping difficulties, fatigue, headache, joint and muscle pain, cognitive changes, vaginal dryness, and loss of sexual desire
- Menopausal symptoms are commonly experienced for 4-5 years in the years before and after the FMP; however, for some women the duration is longer



WINDOW OF OPPORTUNITY... (Meng-Xia Ji and Qi Yu 2015)

'There is ceaseless debate about MHT since it may relate to breast cancer, coronary heart disease (CHD), strokes and thromboembolism. To prevent postmenopausal osteoporosis, how can we weigh the risk/benefit and when should we start menopause hormone therapy?

When MHT is started in women less than 60 years old and/or less than 10 years postmenopausal, the CHD events and overall mortality are decreased, and the overall benefits outweigh risks. Contrarily, when MHT is started in women older than 60 years old and/or longer than 10 years after menopause, there is a null effect and sometimes even an adverse effect. That is the window of opportunity hypothesis.



- '...The hypothesis is further validated by data published recently from the DOPS study (2012) which suggests that MHT can reduce cardiovascular endpoints in women if started shortly after menopause, which happens to be the period of fast bone loss. Thus, the timing hypothesis should be kept in mind when we are prescribing hormones to prevent postmenopausal osteoporosis...'

Are we truly biopsychosocial?

Factors such as physical activity, good sleep, social participation, optimism, positive affect & healthy eating are well known factors that optimise neuroimmune health

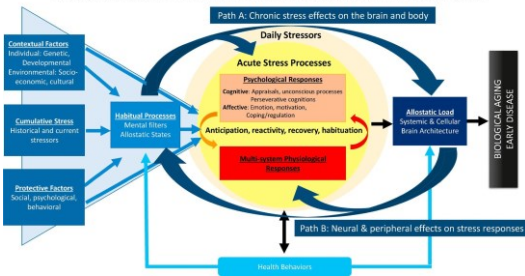
Instead of seeing people as a mechanical entity needing to be fixed, we must see people with rich, varied life experiences that shapes their daily interaction with the world they find themselves in

Remember...

Our modern understanding of how people interact with & respond to their stressors (including pain) are built around a truly person-centred biopsychosocial model of human well-being.

• Stress is necessary for adaptation, but uncontrolled, maladaptive stress responses are linked to a number of chronic health problems. Factors associated with resilience can buffer the negative effects of stress and are therefore key clinical targets for clinicians working with people with a variety of health complaints. Also fostering resilience is hugely important for any health promotion strategy

Transdisciplinary model of stress: Integrating contextual, historical, habitual, and acute stress processes



So...

What are the issues that menopausal women care about?

What are the issues they SHOULD care about?

Pelvic Health At Menopause

GSM - what does it cover?



GSM...or vaginal atrophy or senile vaginas??

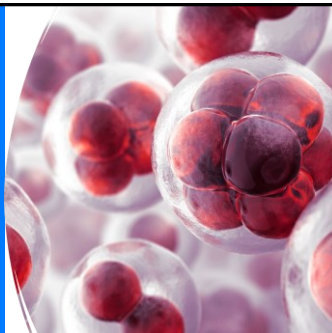
- Genital
- Sexual
- Urinary

Genitourinary syndrome of menopause: new terminology for vulvovaginal atrophy from the International Society for the Study of Women's Sexual Health and The North American Menopause Society

GSM: Genitourinary Syndrome of Menopause

- Genitourinary syndrome of menopause (GSM):
- Affects up to 84% of women
- leads to changes in the vulvovaginal tissues.
- These changes cause vaginal dryness, pruritus, dyspareunia, increased daytime urinary frequency, urgency and urinary incontinence, increased risk of UTI, pain with sex
- SWAN study: women aged 42-52 at enrolment, of those who had no pain with sex at baseline, at 13 years follow up almost 50% developed dyspareunia

- What's happening hormonally?



Oestrogen sensitivity

- The urinary bladder, trigone, urethra, vagina and vulvar vestibule all have a common embryological origin (Gandhi et al 2016)
- Because of this, the genitals, lower urinary tract, levator ani muscles and supporting tissues (including the uterosacral ligaments and fascia) are all oestrogen receptive (Manella et al 2013, Nappi et al 2019)

Oestrogen is also:

- Vasoactive
- Supports glycogen production which works with lactobacilli to maintain vaginal acidity (pH 4-4.5)
- This works in conjunction with the cervicovaginal fluid to inhibit inflammation, bacterial pathogens such as BV & diseases such as HIV and herpes simplex
- (Chappell et al 2015, Linhares et al 2019)

And:

- Oestrogen plays an important role in the proliferation of the vaginal epithelium and maintenance of the rugae, which contribute to stretch, compliance and lubrication during sexual stimulation

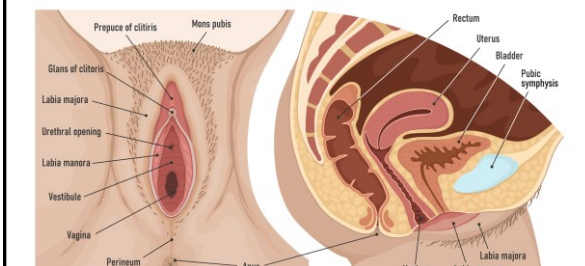
What about urinary function?

- It supports the urethral epithelium & periurethral collagen, & also increases urethral resistance.
- It helps to raise the bladder sensory threshold and promote detrusor relaxation.
- Has a role in pelvic/bladder support via its role in collagen synthesis & breakdown (Lindsay 2021)
- The impact of oestrogen on muscle mass/strength also impacts on urogynaec function (Calleja-Agius & Brincat 2015)

What about Androgens?

- The clitoris, vulva, vestibule, urethra, anterior vaginal wall, periurethral tissue, bladder & pelvic floor also respond to androgens (Simon et al 2018, Traish et al 2018)
- Androgens modulate blood flow, are precursors for oestrogen production & have independent roles in maintaining urogenital structure & function.
- Free testosterone levels are associated with sexual desire/ masturbation in healthy young women but decline w/age and menopause (O'Neill & Eden 2017) but also affect limbic system disorders such as sleep, anxiety & mood disorders

INTERNAL PELVIC VISCERA AND FEMALE EXTERNAL GENITALIA



Does everyone develop GSM?

- Smoking is associated with earlier onset of menopause and is linked with vaginal atrophy, probably as a result of its effect on tissue oxygenation
- Women who have never had a vaginal birth have been observed to have more GSM symptoms
- In some studies, an increased level of sexual activity has been associated with fewer atrophic changes and GSM symptoms but...correlation vs causation vs misogyny...

When does GSM happen?

- The onset of GSM occurs between 1 and 7 years after the menopause and by 7-10 years, 50-65% of women report clinical signs and symptoms.
- **This percentage continues to rise as the time elapsed since the menopause increases (Palacios et al 2018)**
- Women often experience multiple symptoms & this can have a significant effect on the QOL (Lindsay 2021)

Vaginal Oestrogen

- Improves glycogen production & storage
- Increases resilience & elasticity of vaginal cells
- Decreases vulvovaginal pH
- Improves vascular function & transvaginal exudate
- Nb: not all vulvovaginal/bladder issues are due to GSM...



'Symptoms of GSM can markedly influence quality of life...'

- A survey of 300 postmenopausal women compared mean scores for the Menopause Specific Quality of Life Scale (MSQLS), for women with/without GSM, and found that quality of life was significantly lower in women with GSM
- A review of GSM found that self-esteem and intimacy appear to be negatively affected by GSM symptoms, decreasing the quality of life of women



Di Bonaventura et al 2015

- 'For women with moderate or severe genital symptoms, the negative impact on quality of life can be comparable to the impact of chronic diseases such as arthritis and chronic obstructive pulmonary disease.'
- 'The association between vulvovaginal atrophy symptoms and quality of life among postmenopausal women in the United States and Western Europe'



Genitourinary Syndrome of Lactation (GSL): A New Perspective on Postpartum and Lactation-Related Genitourinary Symptoms

Sara Paremlinar, MPH¹, Raney Burns, MD², Katie Shover, BS³, Raven Grant, BS⁴, Annelita Stegmaier, BS⁵, Sophie Jan, BS⁶, Andrea Alvaro-Morales, BS⁷, Jill Krugel, MD⁸, Rachel Rubin, MD⁹

Introduction: The pathophysiology of GSM is complex and multifactorial, involving hormonal, psychological, and anatomical factors. The aim of this study was to explore the pathophysiology of GSM, describe the clinical manifestations, review tools for assessment of GSM, and summarize current and emerging treatment options for GSM.

Aims:

- Explore the pathophysiology of GSM.
- Describe the clinical manifestations.
- Review tools for assessment of GSM.
- Summarize current and emerging treatment options for GSM.

Methods: A literature review was conducted to identify the most pertinent research on the pathophysiology, clinical manifestations, and treatment options for GSM.

Pathophysiology of Lactation and its Impact on Genitourinary System: Lactation is associated with a decrease in estrogen levels, which can lead to GSM symptoms. The diagram shows the relationship between lactation, estrogen levels, and GSM symptoms.

Clinical Manifestations: GSM symptoms include vaginal dryness (31%), dyspareunia (18%), and vulvovaginal atrophy (8%).

Tools for Assessment: Tools for assessment include the Menopause Specific Quality of Life Scale (MSQLS), the Vaginal Health Index (VHI), and the Vaginal Health Questionnaire (VHQ).

Management and Treatment Approaches: Management and treatment approaches include non-pharmacological (lubricants, moisturizers, vaginal dilators) and pharmacological (topical estrogen, systemic estrogen, ospemifene).

Conclusions: GSM is a complex condition that can significantly impact quality of life. It is important to explore the pathophysiology of GSM, describe the clinical manifestations, review tools for assessment, and summarize current and emerging treatment options for GSM.

- Why isn't it treated better?

Symptoms are not always reported nor treatment sought because women often accept the effects of GSM as a natural part of ageing, are embarrassed to seek help or may not find it bothersome.

Nearly half (49%) report finding it hard to talk to medical pro's about their symptoms (Castelo-Branco et al 2015) and only 25% seek treatment (Panay 2018)



Vaginal Symptoms

- Oestrogen depletion can lead to vaginal atrophy, due to the impact on collagen & elastin, leading to a decrease in vaginal length and width.
- The cervical mucosa and vulvovaginal epithelium become thinner & more susceptible to injury.
- As the epithelium thins, the rugae decrease, resulting in a smoother vaginal wall
- Blood flow decreases because vaginal perfusion both at rest & during sexual arousal is governed by androgens & oestrogen (Traish 2018)

- Glycogen levels decrease and the vaginal microbiome is altered

A reduction in lactobacilli results in a more alkaline environment, which may lead to an overgrowth in gr-flora such as Staph or group B Streptococcus, contributing to inflammation/infection (Gandhi et al 2016)

The altered microbiome lowers immune function & vaginal fluid viscosity alters, often becoming thinner/insufficient, resulting in dryness, irritation & increased discomfort (Lindsay 2021) This is the predominant symptom for 75% of women (Panay 2018)



remember

- it can take 4-6 weeks to see effects
- If you stop, the symptoms will return
- Vaginal oestrogen may be beneficial for both irritation & incontinence BUT it works even better when combined with pelvic rehab (Mercier 2023)

What about dhea?

- Vaginal oestrogen is considered the gold standard
- Converted by the cells into estradiol, estrone & testosterone
- Not as well studied as vaginal oestrogen, no head to head

Pharmacologic treatments for GSM

Treatment	Product Name	Dose
<i>Vaginal Cream</i>		
17-beta-estradiol cream	Estrace, generic	0.5-1gm daily for 2 weeks then 0.5-1gm 1-3x per week
Conjugated equine estrogens cream	Premarin	0.5-1gm daily for 2 weeks then 0.5-1gm 1-3x per week
<i>Vaginal Inserts</i>		
Estradiol vaginal tablets	Vagifem [®] , Yuvafem [®]	10mcg inserts daily for 2 weeks and then 2x per week
Estradiol soft gel capsules	ImVcxxx [®]	4, 10 mcg inserts daily for 2 weeks and then 2x per week
DHEA (prasterone) inserts	Intrarosa [®]	6.5mg capsules daily
<i>Vaginal Ring</i>		
17-beta-estradiol ring	Estring [®]	1 ring inserted every 3 months
<i>SERM</i>		
Ospemifene oral tablets	Ospheva [®]	60mg tablet daily

DR RACHEL RUBIN

Porterfield et al 2022

Notable genital symptoms of GSM include vaginal dryness, burning, pruritus, and pain. Urinary symptoms include urinary urgency, dysuria, and recurrent urinary tract infections. Sexual symptoms include lack of lubrication, discomfort or pain, decreased libido, and impairment of arousal and orgasm

While estimates vary as to the prevalence of GSM symptoms in postmenopausal women, roughly half of postmenopausal women in Western countries report symptoms of GSM, with approximately half reporting moderate to severe symptoms

Urinary Symptoms

- The most common urinary symptom of GSM is UTI, in approx. 20% of women (Panay 2018)
- Thinning of the urethral & bladder mucosa can lead to OAB symptoms
- An increase in constipation may also increase symptoms

- Urinary Symptoms

The bladder microbiome is also altered, with a reduction in lactobacillus being reported in postmenopausal women (Curtiss et al 2018)

There is also a decrease in collagen & elastin in the urethra & bladder,

Overlap with effects of ageing?

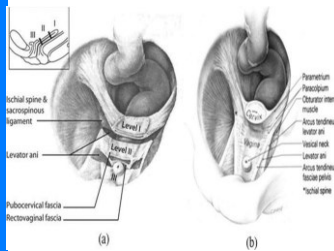
- Oestrogen receptors are found in the uterosacral ligaments, levator ani muscles and pubocervical fascia.
- Animal studies show that oestrogen stimulates collagen synthesis in the pelvic floor (Clark et al 2005)

Oestrogen Receptors

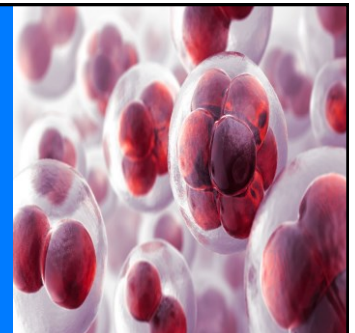


Consider the ATFP

- Plays a key role in bladder and urethral support
- Has Type1 (tensile strength) and Type3 collagen (flexibility)
- Post menopause Type1 collagen decreases - possibly increasing the risk of UI and POP, probably as a result of reduced anterior vaginal support and urethral pressure (Moalli et al 2004)



- Can we differentiate GSM and effects of ageing?



We already know about the effects of ageing...

- In common with all skeletal muscles, the PFM's lose mass with age
- Consider the effect of oestrogen on Actin/Myosin?
- Pereira (2016) showed decreased EMG activity in the pfm's of peri and postmenopausal participants (nullipars had the most activity)

What about weight gain?

- Abdominal adiposity may contribute to a greater risk of POP as result of greater IAP - more commonly seen in women with high BMI and waist circumference >88cm (Handa 2004)
- But also - constipation /obstructed defaecation also increases at midlife (Varma 2008)

The good news!

- POP may spontaneously regress after the menopause!
- Reviewing an 8-year period, Handa (2004) found significant levels of resolution for grade 1 POP and up to 9% for grades 2-3
- (this may represent changes in other factors such as lifestyle/occupation at this time of life)

Systems of Continence & Oestrogen...

- Urethral softness
- Surface tension
- Sub-mucosal vascular cushion
- Sphincter mechanism competence
- Bladder Elasticity
- Bowel Function - constipation
- Also: vulvovaginal pH - is it really a uti?



Changes in urinary system

- Decreased closure pressure
- Decreased bladder elasticity
- Decreased bladder contractility
- Increased sensitivity

And...

- Increased BMI and abdominal adiposity
- Increased constipation
- Increased cough (histamine)
- All affect pelvic health at menopause!!

Is it the menopause or ageing?

- Incontinence prevalence increases with age: 50% of post-menopausal women have urinary symptoms:
- Stress UI, Urge UI, Mixed UI, Nocturia
- Problem: if the issue isn't related to IAP, it isn't as predictable so more problematic


So... what can we do?

- Awareness
- Conversation - ask the right questions
- Look!

• Hormonal support


AND

- A whole person approach to Pelvic Rehab



GSM + Bladder Health

- 'GSM includes urinary symptoms, such as recurrent urinary tract infections, overactive bladder, dysuria and UI. UI, including stress UI and urgency UI, is common among women with GSM, affecting 30–50% of them..' (Mercier et al 2023)
- A Cochrane Review showed that vaginal HT may moderately improve UI symptoms in postmenopausal women (four studies, three including women with stress UI and one including women with urgency UI) (Codey et al 2012 'Oestrogen therapy for urinary incontinence in post-menopausal women')



Ying-yu Chen et al 2021: 'Estrogen for the prevention of recurrent urinary tract infections in postmenopausal women: a meta-analysis of randomized controlled trials'


- rUTIs are commonly encountered in postmenopausal women. Optimal non-antimicrobial prophylaxis for rUTIs is an important health issue. The aim of this study was to evaluate the use of estrogen in the prevention of rUTIs versus placebo.
- Conclusions: Compared with placebo, vaginal estrogen treatment could reduce the number of rUTIs and lower the vaginal pH in postmenopausal women.

What about Non-Hormonal Strategies for vulvovaginal health?



Palma et al: 'Vaginal atrophy of women in post menopause (2016)

- Unlike vasomotor symptoms, GSM tends to be both chronic and progressive, with one study finding 84% of postmenopausal women to exhibit signs of GSM by six years after menopause



What are the options? Is there evidence?

- The decline in postmenopausal serum oestrogen concentration results in several changes in the vulvovaginal and vesicourethral areas, resulting in the genitourinary syndrome of menopause, including symptoms such as vaginal atrophy
- Although topical oestrogen combined with pelvic rehab produces great effects, not every person wants/ is suitable for hormonal Rx

What about: hyaluronic acid?

> J Sex Med. 2021 Jan;18(1):156-166. doi: 10.1016/j.jsexm.2020.10.016. Epub 2020 Dec 5.

Hyaluronic Acid in Postmenopause Vaginal Atrophy: A Systematic Review

Carlos Campagnaro M Dos Santos¹, Maria Laura R Uggioni¹, Tamy Colonetti¹, Laura Colonetti¹, Antonio José Grande², Maria Inês Da Rosa³

Affiliations + expand
PMID: 33293236 DOI: 10.1016/j.jsexm.2020.10.016

Results:

- The results presented suggest that treatment with hyaluronic acid, when compared with the use of estrogens, does not present a significant difference in the results obtained for the outcomes: epithelial atrophy, vaginal pH, dyspareunia, and cell maturation.
- **Clinical translation: Hyaluronic acid appears to be an alternative to non-hormonal treatments for the signs of vaginal atrophy and dyspareunia.**

And: Specifically for cancer survivors?

Review > Healthcare (Basel). 2022 Aug 13;10(8):1528. doi: 10.3390/healthcare10081528.

Hyaluronic Acid: A Valid Therapeutic Option for Early Management of Genitourinary Syndrome of Menopause in Cancer Survivors?

Rosella E Nappi^{1,2}, Silvia Martella³, Francesca Albani⁴, Chiara Cassani^{5,6}, Ellis Martin⁷, Fabio Landoni⁸

Affiliations + expand
PMID: 36011183 PMID: PMC9408661 DOI: 10.3390/healthcare10081528
Free PMC article

Nappi et al 2022

- Unfortunately, GSM may occur early in the lifespan of women or be exacerbated following anticancer treatments, such as chemotherapy, ionizing radiation, or surgical removal of reproductive organs.
- Symptoms of GSM are often under-reported by women, under-estimated and under-diagnosed by health care providers (HCPs), and subsequently under-treated, despite their profound negative impact on the quality of life.

Nappi et al 2022

- Among non-hormonal treatments, hyaluronic acid-based moisturizers have shown promising clinical results both in healthy women and in cancer patients or survivors.
- Its strong water-binding properties provide lubricating and moisturizing effects, which contribute to maintaining a proper level of hydration and viscoelasticity in several body parts, including the urinary tract and genital tissues.
- Hyaluronic acid-based moisturizers are effective, safe, and well tolerated; therefore, they may represent **a valid option for the early management of GSM-associated symptoms in every woman with a history of cancer who is unable or unwilling to undergo hormone-based therapies.**

Agrawal et al 2024

- There were no clinically meaningful differences between vaginal HLA and vaginal estrogen for the treatment of GSM after 12 wk. Vaginal HLA may be a promising non-hormone therapy for GSM.

A randomized, pilot trial comparing vaginal hyaluronic acid to vaginal estrogen for the treatment of genitourinary syndrome of menopause

Agrawal, Surbhi MD^{1,2}; LaRex, Zoe MD³; Nagpal, Shavy MD⁴; Oxt, Antonette MD⁵; Friedman, Steven MS⁶; Haski, Estim M PhD⁷; Nachtigall, Lila MD, MScP⁸; Brucker, Benjamin M MD⁹; Escobar, Christina MD¹⁰

Author Information@

Menopause (10.1097/GME.0000000000002390, July 23, 2024. | DOI: 10.1097/GME.0000000000002390@



What about: vibrators?



Effect of intravaginal vibratory versus electric stimulation on the pelvic floor muscles: A randomized clinical trial

Marina P. Rodrigues^{1,2}, Lu J.F. Barbosa¹, Luciana L. Paiva³, Suzana Mallmann⁴, Paulo R.S. Sanchez⁵, Charles F. Ferreira^{6,7}, José G.L. Ramos⁸

Rodrigues et al 2019

- Aims: To compare the use of an intravaginal vibratory stimulus (IVVS) versus intravaginal electrical stimulation (IVES) on pelvic floor muscle functionality in women with pelvic floor dysfunctions who cannot voluntarily contract these muscles.
- After baseline assessment, women that met the inclusion criteria were randomized to receive once-weekly 20-minute sessions of IVVS or IVES for 6 weeks.

Rodrigues et al 2019

- Twenty-one women were randomly assigned to each group; 18 completed the IVVS and 17 completed the IVES protocols.
- **The IVVS group presented a significant increase in PFM strength in relation to the IVES group ($p = 0.026$).**
- Conclusion: Both techniques were beneficial, **but IVVS was significantly superior to IVES in improving pelvic floor muscle strength**
- **So for women with a CI to electrical stimulation....**

> Int Urogynecol J. 2024 May;35(5):1085-1092. doi: 10.1007/s00192-024-05775-7. Epub 2024 Apr 26.

The Role of Vibrators in Women's Pelvic Health: An Alluring Tool to Improve Physical, Sexual, and Mental Health

Alexandra Dubinskaya^{1,2}, Priya Kohli³, Poone Shoureshi⁴, Catherine Breese⁵, Victoria Scott⁶, Jennifer T Anger⁶, Karyn S Eilber⁶



What about pelvic rehab?

- **Mercier et al (2019): 'Pelvic floor muscle training as a treatment for genitourinary syndrome of menopause: A single-arm feasibility study'**
- Objectives: Treatments for genitourinary syndrome of menopause (GSM) may not be suitable for all women, may not be completely effective, and may cause adverse effects. Therefore, there is a need to explore new treatment approaches. **The objectives were to evaluate the feasibility of using a pelvic floor muscle training (PFMT) program in postmenopausal women with GSM, and to investigate its effect on symptoms, signs, activities of daily living (ADL), quality of life (QoL) and sexual function.**

Mercier et al 2019

- Results: 32 women participated.
- The study completion rate was high (91%), as was participation in treatment sessions (96%) and in-home exercises (95%).
- Post-intervention, there were significant reductions in GSM symptoms and signs as well as in its impacts on ADL, QoL and sexual function

Mercier et al 2020

- 'Pelvic floor muscle training: mechanisms of action for the improvement of genitourinary syndrome of menopause'
- Conclusion: Our findings suggest that PFMT improves blood flow in vulvovaginal tissues, PFM relaxation capacity, and vulvovaginal tissue elasticity in postmenopausal women with GSM and UI.

What are the takeaway messages from the Mercier studies?

- Pelvic rehab was associated with significant improvements in GSM - decreased dryness, itching, irritation, dyspareunia - impact on ADL as well as sex
- Possible mechanism: increased blood flow (internal pudendal and dorsal arteries) and improved coordination pfm's

Pelvic Rehab

- Incontinence: exercise improves pelvic floor muscle strength and coordination
- GSM: better able to RELAX the pfm's, better coordination
- Decreased passive tone after treatment - not anticipating pain with penetration

Education was a vital component

- Increased knowledge about how pfm's work
- Increased knowledge about coordination
- **Time needed - 12 weeks to improve blood flow & pfm function**

Mercier et al 2023 'Pelvic floor muscle rehabilitation for genitourinary syndrome of menopause: why, how & when?'

- Genitourinary syndrome of menopause (GSM) is caused by chronic deprivation of estrogen and other sex steroids during the postmenopausal period, which leads to changes in the vulvovaginal tissues.
- These changes cause bothersome symptoms, such as vaginal dryness, pruritus, dyspareunia, increased daytime urinary frequency, urgency and urinary incontinence, which have considerable negative effects on women's quality of life and sexual function.
- Recent studies have investigated a novel treatment approach for GSM....

Mercier et al 2023

- Pelvic floor muscle (PFM) rehabilitation, a low-cost conservative management with no side-effects, has been studied alone or in combination with other treatment modalities to reduce the signs and symptoms of GSM.

Mercier et al 2020

- PFMT **significantly improved blood flow** parameters in both arteries and **significantly increased the speed of PFM relaxation** after a contraction
- After the intervention, a marginally **significant decrease in PFM tone** was observed, as well as **an increase in PFM strength**
- Finally, **improvements in skin elasticity and introitus width** were observed as measured by the Vaginal Atrophy Index

Blood Flow

- Increased vulvovaginal blood flow on doppler – both after the exercises but also at rest
- Also noted increased vaginal secretions
- Increased pinkness of tissue
- Increased thickness mucosa
- Increased elasticity
- Wider introitus

NB: Dryness

- Dryness = Discomfort with exercises
- Thinning of mucosa lead to spotting/bleeding after manual therapy/ exercises
- Explain why it's happening
- In the Mercier study, resolved after 1 month
- * maybe use lube during exercises



What about bladder dysfunction?

'The effect of 12 weeks of estriol cream on SUI post-menopausally' West et al 2023

- Topical oestrogen increases urethral resistance by thickening the urethral epithelium & increasing the vascularity
- Objectively dry: 42%
- Symptomatically cured 28%
- 12 weeks of treatment
- What's missing?



Sam et al 2023: 'Anatomy, Abdomen and Pelvis, Sphincter Urethrae'

- The female external urethral sphincter is composed of striated muscle and is located distally and inferiorly to the bladder neck in women between the vaginal orifice and clitoris.
- This sphincter is composed of three parts:
- The first part is a circular muscle.
- The second part is known as the urethral compressor muscle and extends anteriorly to connect with the ischial rami.
- The third part surrounds both the vagina and urethra and is known as the urethrovaginal sphincter.

•Sam et al 2023: 'Anatomy, Abdomen and Pelvis, Sphincter Urethrae'

- Contraction of the urethrovaginal sphincter leads to constriction of both the urethra and vagina.
- Skene glands are a pair of mucus glands located on either side of the distal end of the female urethra. They are also sometimes called the lesser vestibular glands.
- They secrete lubrication to the urethral meatus.
- They are homologs of the male prostate gland.

Sam et al 2023

- The pudendal nerve innervates the external urethral sphincter, originating from the S2 to S4 nerve roots.
- The external urethral sphincter (or rhabdosphincter) is primarily made of striated skeletal muscle and is under voluntary control via the deep perineal branch of the pudendal nerve and nicotinic receptors
- When the bladder is full, the parasympathetic tone increases while sympathetic activity decreases. This leads to the relaxation of the internal sphincter muscle, which, along with a parasympathetic mediated detrusor contraction, allows for normal voiding and bladder emptying

McCloskey et al 2024: 'What do we really know about the external urethral sphincter?'

- Loss of EUS function and sarcopenia is associated with ageing
- While there is agreement that contraction of EUS skeletal muscles maintains urinary continence, it is increasingly recognised that the smooth muscle layers also have a significant contribution.
- In fact, urethral pressure may almost entirely reflect smooth muscle activity at rest and during bladder filling, particularly in females, with the **EUS skeletal muscle becoming active during physical stress e.g. coughing or sneezing to provide additional closure during short periods of increased abdominal pressure**

McCloskey et al 2024: 'What do we really know about the external urethral sphincter?'

- SUI results from a **combination of intrinsic sphincter deficiency and urethral hypermobility** due to malfunctioning of the urethra supporting structure
- Considering that volume and strength of skeletal muscle generally start to decline in one's thirties and become noticeable in one's fifties, age-related changes in the EUS appear to play a critical role in the pathogenesis of SUI.
- Since age-related deterioration of skeletal muscle, known as sarcopenia, occurs preferentially in fast (type II) muscle fibres, it is of interest to know whether age-related changes in human EUS, comprising predominantly of slow (type I) muscle fibres can be considered as a manifestation of sarcopenia.

McCloskey et al 2024: 'What do we really know about the external urethral sphincter?'

Histological analysis of female EUS biopsy specimens also demonstrated that SUI patients are characterized by reduced EUS fibres associated with increased connective tissue compared to continent subjects

In addition, EMG revealed denervation of the EUS of SUI patients as evidenced by increased fibrillation potentials and fewer motor units than continent subjects. Thus, age-related EUS dysfunction may also be largely due to loss of motoneurons, as in the case of sarcopenia



McCloskey et al 2024: 'What do we really know about the external urethral sphincter?'

- **PFM training is the optimal physical therapy that effectively improves SUI**
- However, PFM training does not offer a complete, long-term cure in about half of SUI patients, and thus its effectiveness should be enhanced.
- Combination of PFM training with whole-body strength exercise could enhance PFM training-induced EUS hypertrophy by anabolic actions of myokines that are released from contracting skeletal muscles
- Importantly, preventive PFM training would be more effective than aiming to restore reduced EUS mass and/or strength.

Resistance Training Reduces Urinary Incontinence and Improves the Strength of Pelvic Floor Muscles

- **Urinary incontinence reduced by 40%**
- The analysis of the effect sizes demonstrated that **resistance training had a large and significant effect on the reduction of UI.**
- Wikander et al, ics poster
- Analysis of the frequency and severity of UI revealed that **8 participants experienced less frequent UI**, while 3 participants reported **a reduction in the severity of UI.**
- The effect of the training program on frequency was statistically significant with a **33% reduction in the frequency of UI**



'The pathophysiology of SUI: SR/MA' Falah Hassani et al 2021

- Some women with SUI have less urethral blood flow (thinner submucosa)
- The 2 main drivers of SUI are intrinsic sphincter deficiency and urethral hypermobility - we now know the main factor is ISD
- 'Contraction of the SUS provides direct closure force & appears to be a major contributor to urinary continence control...**urethral sphincter closure is the strongest determinant of SUI**'



•SUI factors to consider:

- Sphincter strength
- Oestrogen availability
- Pudendal nerve – traction due to constipation? Obturator internus dysfunction?

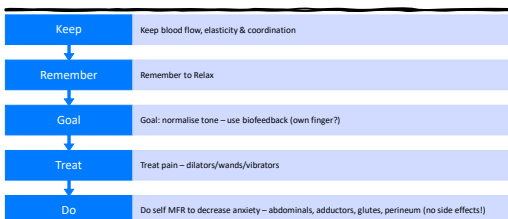


Think about PFMT as normalisation of function!

- Yes: squeeze when you sneeze
- But also:
- Important to learn how to relax!



And don't forget - self efficacy!



Pelvic Rehab + Vaginal Oestrogen = Better Together!

- Kagan et al 2019: 'Practical Treatment Considerations in the Management of Genitourinary Syndrome of Menopause'

But also: Sasirekha et al (2021)

- **Augmented Core Breathing Pelvic Floor Muscle Training for Patients with Genitourinary Syndrome in Different Phases of Menopause**
- Vulvovaginal atrophy is a common condition that affects 39–63% of postmenopausal women...from reduced oestrogen levels in vulvovaginal tissues, leading to reduced blood flow and collagen, and elastin fibre degeneration, as well as changes in epithelium cells
- Excitability in pelvic floor muscle tone may also be found in patients with symptomatic vulvovaginal atrophy due to a defensive response caused by pain and discomfort



Sexual Health After Menopause

Mercier et al 2023

- "...women with GSM reported that physical changes to their vulvovaginal tissues caused negative impacts on their sexual function, more specifically on their arousal, sexual satisfaction and capacity to reach orgasm
- In a survey including 1480 postmenopausal women, those with GSM were four times more likely to have sexual dysfunction compared to those without GSM
- Sexual function in women with GSM is an important issue to address as the majority of postmenopausal women consider that a satisfying sex life is essential to their self-esteem as well as maintaining a good relationship with their partner and a meaningful life
- Therefore, it is essential to provide effective treatments to reduce or eliminate GSM symptoms in women...

Hormones are great but '...As these current treatments appear to be unsatisfactory for some women, alternatives need to be explored...'

- In a survey including 1858 women with GSM (Women's EMPOWER), 56% of women treated with vaginal HT, systemic HT or vaginal moisturizers still reported feeling symptoms and were 'somewhat or not satisfied' with their treatment efficacy
- In the REVIVE survey, 42% of the women using vaginal moisturizers and 23% of the women using vaginal HT also reported low satisfaction with treatment efficacy
- These results could be due to low treatment adherence, as shown in the Women's EMPOWER study
- In this survey, a large percentage of women undergoing treatment for symptoms of GSM (presently or in the past) reported that they did not follow the recommended dosage and used the treatment intermittently (vaginal moisturizer, 84%; vaginal HT, 56–79%)

Pelvic Rehab + Vaginal Oestrogen?

- Studies have shown that vaginal HT improves GSM symptoms in most women, and PFM rehabilitation could be added to this treatment to address remaining issues.
- Mercier et al's 2023 single-arm study included eight women using vaginal HT; After the PFMT program, 7/8 of women (88%) reported improvements in their most bothersome symptom of GSM, which significantly improved regarding severity
- GSM signs globally improved on the Vaginal Health Assessment Scale, mainly regarding vaginal colour and there was a tendency for improvement in vaginal secretions

Capobianco et al 2012 'Effects of intravaginal estriol and pelvic floor rehabilitation on urogenital aging in post-menopausal women'

- RCT including women with GSM, stress UI and recurrent urinary tract infections compared the impact of a combined treatment, including PFMT, PFM electrostimulation and vaginal HT, to vaginal HT alone
- After a 6-month intervention, a higher symptom improvement rate was found in the combined treatment compared to the control treatment (vaginal HT alone) These results support the possible added value of PFMT in women already receiving vaginal HT for the treatment of GSM

PFMT for GSM - when? (Mercier 2023)

- ‘.. In a longitudinal study including 172 women from their pre-menopause to their perimenopause or post-menopause stage, 21% of women felt GSM symptoms in the first year post-menopause and 47% had symptoms 3 years post-menopause
- In our cohort study, 34% of women reported feeling their first symptoms of GSM during their perimenopause and 65% during their post-menopause
- Therefore, women could start PFM rehabilitation at any time during menopause depending on the onset of the signs and symptoms.

PFMT for GSM - when? (Mercier 2023)

- Education about GSM could begin in the premenopausal period to inform women about its signs, symptoms and treatments options, including PFMT...Moreover, as a high proportion of women with GSM have UI, prevention with PFMT could be beneficial starting in early menopause’

Geography & Language



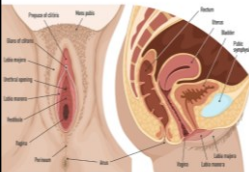
Pudenda



- Pudere: to make ashamed
- ‘...from the shamefacedness that is in women to have them seen’

VULVA OR VAGINA?

INTERNAL PELVIC VISCERA AND FEMALE EXTERNAL GENITALIA



**It's a VULVA!
Not a
VAGINA!**



But also:

> J Sex Med. 2023 Feb 27;20(3):247-252. doi: 10.1093/jsmed/qdac027.

How many nerve fibers innervate the human glans clitoris: a histomorphometric evaluation of the dorsal nerve of the clitoris

Maria Uloko ¹, Erika P Isabey ², Blair R Peters ³ &

Affiliations + expand

PMID: 36763957 DOI: 10.1093/jsmed/qdac027

•What is clitoral phimosis?

clitoral glans urinary meatus
corpus cavernosum vaginal opening
crus of clitoris bulb of vestibule

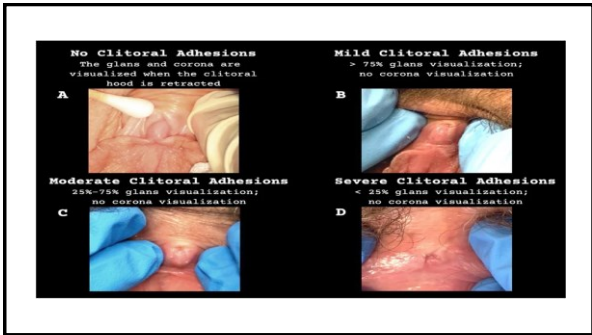


The Journal of Sexual Medicine
Volume 19, Issue 9, September 2022, Pages 1412-1420

Original Research & Reviews
Female Sexual Function

A Retrospective Case Series on Patient Satisfaction and Efficacy of Non-Surgical Lysis of Clitoral Adhesions

Monica C. Myers BS¹, Jennifer P. Romanello BS², Elsa Nico BS³, Joanna Marantidis MD⁴, Tami S. Rowen MS, MD⁵, Rachael D. Sussman MD⁴, Rachel S. Rubin MD⁴



Participant Reflections on the Lysis Procedure

"I had no idea about the clitoris before meeting [this doctor] and I believe this needs to change so women are able to better understand their bodies."

"The procedure gave me more sexual confidence and freedom as well as greater understanding of my genital anatomy."

"It's critical that women are educated to ask for this examination and for physicians to educate their patients about it."

"It was painless, so easy to recover and an absolute GAME CHANGER for me. I was extremely grateful to receive this."

"It has improved my life and I am relieved it could be treated. I hope other women who have this problem have access to the same treatment."

"It improved my quality of life by helping me understand my body better and led to other forms of sexual exploration and satisfaction because of this."

"This is also something no one talks about - it's embarrassing - which means that the numbers of undiagnosed cannot even be estimated."

"I had external symptoms, but [other] doctors kept swabbing and looking at the vagina."

"After the procedure, I spoke to my two older sisters. Neither of them had ever heard of the adhesions and when they asked their doctors, neither were able to diagnose if my sisters had the same issue. I had been trying to understand my pain for over 10 years by the time [this doctor] officially diagnosed and treated me."

CASE REPORTS

The Use of Specific Myofascial Release Techniques by a Physical Therapist to Treat Clitoral Phimosis and Dyspareunia

Morrison, Pamela MS, PT, DPT, BCB-PMD, IMTC¹; Kellogg Spadt, Susan PhD, CRNP, IF, CST²; Goldstein, Andrew MD³

Author Information@

Journal of Women's Health Physical Therapy 39(1):p 17-28, January/April 2015. | DOI: 10.1097/JWH.0000000000000023

Considerations for Sexual Health

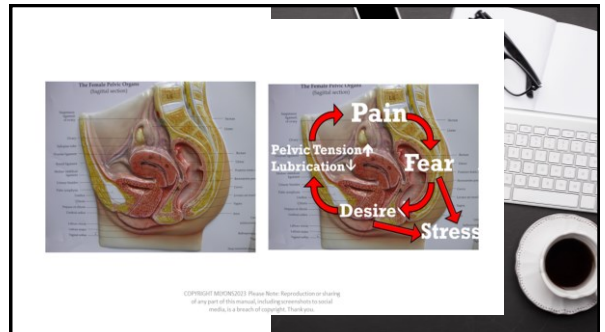
- Fluctuating oestrogen, progesterone, testosterone
- Breast tenderness, disrupted sleep, weight gain, body image
- GSM: decreased vascularity so decreased lubrication

GSM - do women know what it is and that we can help?

(do we?)

Libido - it isn't passive (or spontaneous!)

- Do we passively get fit/strong? Why do you exercise?
- Is the sex worth desiring?
- Are you giving your brain dopamine?
- Are you taking responsibility for your own orgasms?
- Don't wait for desire - if you want to have a sexual relationship (with yourself or others) make it happen!



The Brain Body Connection



The brain

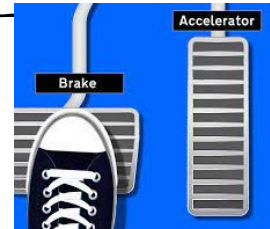
- The biggest sex organ
- Sleep
- Parasympathetic nervous system
- Dopamine driver - daily pleasure hunts to rewire the brain
- Don't have sex if you don't want to, but if you do, make a plan!



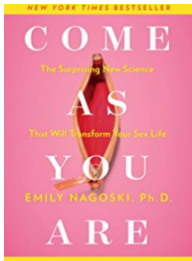
Stress & Sex?

- In one study, high levels of cortisol and chronic stress were related to low levels of genital sexual arousal in women (Hamilton & Meston 2013)
- Plasma oxytocin levels have been associated with genital sexual arousal (Salonia et al 2005)

Sexual Brakes & Accelerators: spontaneous vs responsive desire



Arousal non-concordance

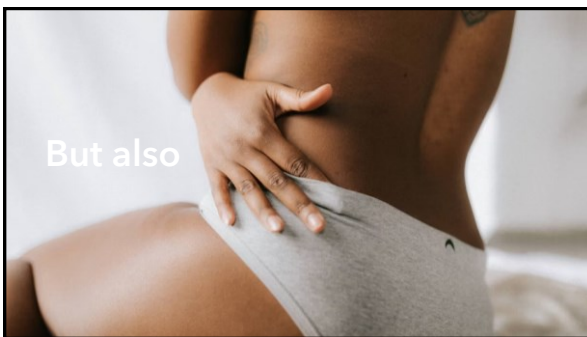


- Behaviour of the genitals may/may not match mental state
- Spontaneous vs Responsive desire

Dual Control Model

- Janssen & Bancroft, Kinsey Institute for Research in Sex, Gender & Reproduction
- Sexual Accelerators: excitation
- Sexual Brakes: inhibition
- Genital sensations, Visual stimulation & Emotional context

But also



Hip Mobility
vs
Gluteal
Tendinopathy
(consider
sexual
ergonomics)



Strong Hips are Happy Hips

- **'Relationship Between Sexual Function and Pelvic Floor and Hip Muscle Strength in Women With Stress Urinary Incontinence'** Hwang et al 2021
- Conclusion: The female sexual function could be related to not only PFM functions but also hip muscle strength in women with SUI...

Ask about Lube

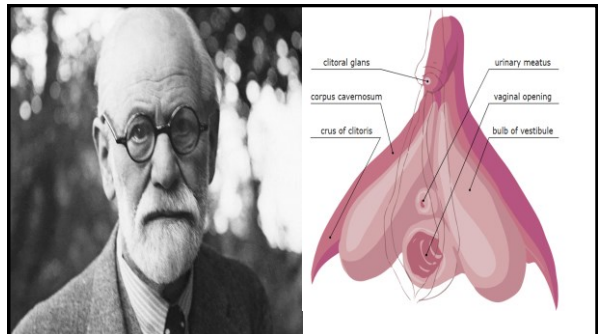
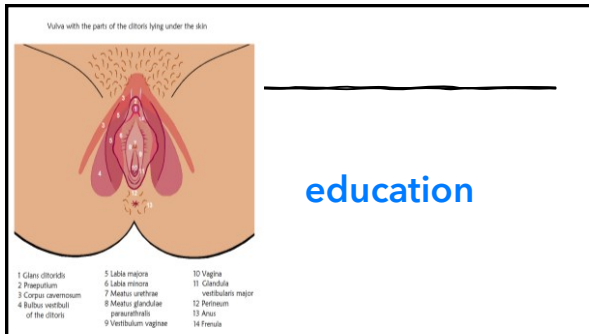
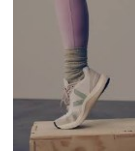
Sex, Gender, Health, Matters, 2022, 2(1): 2044198
 Published online 2022 Mar 22. doi: 10.1080/26410387.2022.2044198
 PMID: 36131312
 Language: English | [English](#) | [Spanish](#)

Lubricants for the promotion of sexual health and well-being: a systematic review

[Caitlin E. Kennedy](#)¹, [Pooja Sengupta](#)², [Jinella Li](#)³, [Lianne Gonçalves](#)⁴ and [Marilisa Nazarembar](#)⁵

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- Not 'do you' but 'when' and 'what type'?
- Can improve sexual enjoyment by 70-80%



Education Matters!

Randomized Controlled Trial > *J Sex Med*. 2017 Jul;14(7):959-967.
 doi: 10.1016/j.jsxm.2017.05.006. Epub 2017 Jun 7.

Effects of Sex Education and Kegel Exercises on the Sexual Function of Postmenopausal Women: A Randomized Clinical Trial

[Sohella Nazarpour](#)¹, [Masoumeh Simbar](#)², [Fahimeh Ramezani Tehrani](#)³, [Hamid Alavi Majd](#)⁴

Affiliations + expand
 PMID: 28601506 DOI: 10.1016/j.jsxm.2017.05.006

Nazarpour et al 2017

Background: The sex lives of women are strongly affected by menopause. Non-pharmacologic approaches to improving the sexual function of postmenopausal women might prove effective

After obtaining written informed consents, they were randomly assigned to one of three groups: (i) formal sex education, (ii) Kegel exercises, or (iii) routine postmenopausal care. After 12 weeks, all participants completed the FSFI again.

Nazarpour et al 2017

• Results: After 12 weeks, the scores of arousal in the formal sex education and Kegel groups were significantly higher compared with the control group (3.38 and 3.15 vs 2.77, respectively). The scores of orgasm and satisfaction in the Kegel group were significantly higher compared with the control group (4.43 and 4.88 vs 3.95 and 4.39, respectively).

• **Clinical implications: Formal sex education and Kegel exercises were used as two non-pharmacologic approaches to improve the sexual function of women after menopause.**

Meta-Analysis > J Sex Med. 2022 Jan;19(1):54-63. doi: 10.1016/j.jsxm.2021.09.017.

Epub 2021 Nov 7.

Educational Programs and Sexual Counselling for Postmenopausal Sexual Dysfunction: A Systematic Review and Meta-Analysis

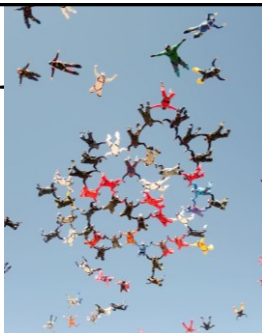
Inés Marques Santos Silva¹, Mafalda Paula Pinto², Diana Gonçalves³

Affiliations + expand

PMID: 34758929 DOI: 10.1016/j.jsxm.2021.09.017

Santos Siva et al 2022

• The studies described sexual education programs, with 4-10 sessions, 45-60 minutes each, including themes like **sexual anatomy, physiological sexual response, menopause, methods of stimulation, and common sexual myths**



Santos Siva et al 2022

• Conclusion: Our meta-analysis shows that **sexual counselling educational programs are effective in improving sexual dysfunction in postmenopausal women when compared to routine care.** These are simple approaches, easily administered with minimal resources that help prevent the psychological and social consequences of sexual dysfunction at this age.



And of course:

Int J Environ Res Public Health. 2020 Apr; 17(8): 2680.
Published online 2020 Apr 14. doi: 10.3390/ijerph17082680

PMCID: PMC7215442
PMID: 32295114

Effects of Physical Exercise on Sexual Function and Quality of Sexual Life Related to Menopausal Symptoms in Peri- and Postmenopausal Women: A Systematic Review

Maria del Carmen Carroelén-Fraile,¹ Agustín Albar-Almazán,^{1*} Antonio Martínez-Amal,¹ David Cruz-Díaz,¹ Esther Díaz-Mohedo,² María Teresa Redecillas-Peiro,³ and Eidel Hita-Contreras¹

The effects of **exercise** on **sexual function** in women

AM Stanton, AB Handy, CM Meston - Sexual medicine reviews, 2018 - academic.oup.com
... **exercise** on multiple domains of **sexual function** in women. ... of acute and chronic **exercise** on **sexual function** in women. ... encouraged to tailor specific **exercise** prescriptions to meet ...
☆ Save ⓘ Cite Cited by 73 Related articles All 8 versions

Effects of physical **exercise** on **sexual function** and quality of **sexual life** related to menopausal symptoms in peri-and postmenopausal women: A systematic review

MC Carroelén-Fraile, A Albar-Almazán, ... - International journal of ... 2020 - mdpi.com
... effects of different **exercise** programs on **sexual function** and quality of **sexual life** related to ... on **exercising** pelvic floor muscles, as they seem to have the largest impact on **sexual function** ...
☆ Save ⓘ Cite Cited by 38 Related articles All 8 versions ⓘ

Exercise-induced orgasm and pleasure among women

Debby Herbenick ¹ & J. Deranis Fortenberry

Pages 373-388 | Received 30 Nov 2011, Accepted 02 Dec 2011, Published online 20 Mar 2012

Download citation | <https://doi.org/10.1080/14681994.2011.647902>

> *Climacteric*. 2020 Oct;23(5):468-473. doi: 10.1080/13697137.2020.1724942. Epub 2020 Feb 27.

Pelvic floor muscle training: mechanisms of action for the improvement of genitourinary syndrome of menopause

J Mercier ¹, M Morin ², A Tang ³, B Reichetzer ⁴, M-C Lemieux ⁵, K Samir ⁶, D Zaki ⁴, F Gougeon ⁷, C Dumoulin ¹

Mercier et al 2020

- Results: PFMT significantly improved blood flow parameters in both arteries and significantly increased the speed of PFM relaxation after a contraction.
- After the intervention, a marginally significant decrease in PFM tone was observed, as well as an increase in PFM strength
- Finally, improvements in skin elasticity and introitus width were observed as measured by the Vaginal Atrophy Index
- Conclusion: Our findings suggest that PFMT improves blood flow in vulvovaginal tissues, PFM relaxation capacity, and vulvovaginal tissue elasticity in postmenopausal women with GSM and UI.

Daily Pleasure Hunts!

> *Menopause*. 2022 Sep 20. doi: 10.1097/GME.0000000000002062. Online ahead of print.

The impact of foot massage given to postmenopausal women on anxiety, fatigue, and sleep: a randomized-controlled trial

Nilay Gökbulut ¹, Emine İbici Akca ², Çigdem Karakayali Ay ³

Affiliations + expand

PMID: 36126237 DOI: 10.1097/GME.0000000000002062



> *Int Urogynecol J*. 2024 May;35(5):1085-1092. doi: 10.1007/s00192-024-05775-7. Epub 2024 Apr 26.

The Role of Vibrators in Women's Pelvic Health: An Alluring Tool to Improve Physical, Sexual, and Mental Health

Alexandra Dubinskaya ¹ ², Priya Kohli ³, Poone Shoureshi ⁴, Catherine Breese ⁵, Victoria Scott ⁶, Jennifer T. Anger ⁶, Karyn S. Eilber ⁴



Results:

• **Conclusions: Vibrator use was associated with improved sexual, genitourinary, and mental health.**

- The mean age of the participants was 54.7 years and the majority of participants were white, post-menopausal and not receiving systemic or local hormone therapy.
- Sexual function significantly improved over time, whereas the rate of bothersome pelvic organ prolapse symptoms and pain scores significantly decreased.
- Rates of urge urinary incontinence decreased although this was not statistically significant.
- There was a significant improvement in the gross appearance of lichen sclerosis lesions and in the severity of vaginal atrophy.
- Rates of depression were significantly decreased.





Post Menopausal Zest!

- “There is no greater power in the world than the zest of a postmenopausal woman” Margaret Mead.
- Rather than an ending, many women find post-menopause a new beginning marked by increased energy, creativity and libido.

Misconceptions About Sexual Health in Older Women

Why We Need to Talk About It

Carol L. Kuhle, DO, MPH, • Xin Zhang, MD • Ekta Kapoor, MBBS

[Open Access](https://doi.org/10.1016/j.mayocp.2020.09.037) • Published: March 10, 2021 • DOI: <https://doi.org/10.1016/j.mayocp.2020.09.037>

Don't guess...ASK!



Menopause & MSK Health

- How does menopause affect
- Muscles
- Tendons
- Joints
- Bones

Al Dughaiter et al 2015

Menopausal symptoms	% with symptoms	% with moderate to very severe
1: hot flash, sweating	47.1	31.1
2: heart discomfort	35.3	10.1
3: sleep problems	26.1	14.3
4: depressive mood	29.4	12.6
5: irritability	28.6	11.8
6: anxiety	31.1	11.8
7: physical and mental exhaustion	64.7	27.7
8: sexual problems	24.4	19.3
9: bladder problems	30.3	12.6
10: vaginal dryness	31.1	14.3
11: joint and muscular discomfort	80.7	51.3



'Maximizing Running Participation & Performance Through Menopause'

• Rothschild & Collingwood 2023

• **When approaching menopause, female runners may be unaware of the physiological changes that can affect the body** and its ability to participate and perform in recreational and competitive sports.

• **Nearly half of recreational female runners are of menopausal age**, and health care professionals, including physical therapists, should be aware of the cardiovascular, musculoskeletal, neuromuscular, and endocrine changes that come with age and menopause to appropriately advise and care for this growing group of female athletes



Musculoskeletal Pain during the Menopausal Transition: A Systematic Review and Meta-Analysis

Chang-Bo Lu¹, Peng-Fei Liu², Yong-Sheng Zhou³, Fan-Cheng Meng³, Tian-Yun Qiao³,
Xiao-Jiang Yang¹, Xu-Yang Li⁴, Qian Xue⁴, Hui Xu⁴, Ya Liu⁵, Yong Han³, Yang Zhang¹

Affiliations + expand

PMID: 33299396 PMCID: PMC7710408 DOI: 10.1155/2020/8842110

Lu et al 2020

- Musculoskeletal pain (MSP) is one of the most severe complaints in women undergoing menopause.
- The estimated overall prevalence of MSP among perimenopausal women was 71%
- Although menopausal women complaining of MSP took up a large proportion of outpatient visits, yet, the majority of them turned out to have no significant imaging findings in magnetic resonance imaging

• Why do you think that might be?

Lu et al 2020

- The Menopause-specific Quality of Life Questionnaire (MENQOL) scale was used in 3 studies.
- For these studies, each of the domains included physical, psychological, and sexual aspects.
- Women reported whether they had experienced each symptom listed in the scale including muscle and joint pain in the last 4 weeks: For these women, the estimated MSP prevalence was 80%
- The Menopause Rating Scale (MRS) was used in 7 studies; Women were asked whether they had experienced the 11 menopausal symptoms shown in the MRS, including muscle and joint discomfort, in the previous month (30 days).
- **Based on MRS, the estimated MSP prevalence was 77%**

Lu et al 2020

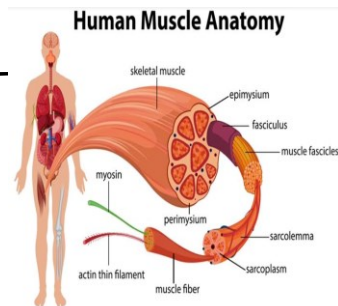
- BMI was assessed in several studies included in the meta-analysis, most of which indicated that BMI was an independent risk factor for MSP.
- Lynnette's group found that women complaining of back pain, joint stiffness, and bone pain demonstrated a significantly higher BMI compared with that of women without pain complaints
- Similarly, Anny's group assessed pain intensity in menopausal women at different BMI levels using the visual analog scale (VAS). The results suggested that women whose BMI exceeded 30 kg/m² were accompanied by significantly higher VAS scores than others

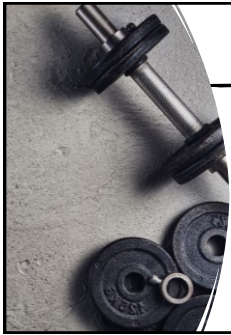
Lu et al 2020

- Females who experienced sleep disruption had increased pain severity
- Also, anxiety and depressed mood symptoms were associated with MSP symptoms
- One study revealed that negative moods towards age can explain a similar proportion of MSP in postmenopausal state

What Does Oestrogen Do For The MSK System?

- Anabolic
- Anti-inflammatory
- Actin/myosin efficacy improved





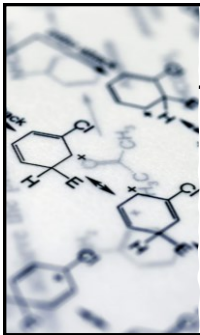
Nkechinyere Chidi-Ogbolu 2019

- ‘...Estrogen has a dramatic effect on musculoskeletal function...estrogen improves muscle mass and strength, and increases the collagen content of connective tissues.
- However, unlike bone and muscle where estrogen improves function, in tendons and ligaments estrogen decreases stiffness, and this directly affects performance and injury rates.’

Nkechinyere Chidi-Ogbolu 2019

‘...Estrogen has a dramatic effect on musculoskeletal function...estrogen improves muscle mass and strength, and increases the collagen content of connective tissues.

However, unlike bone and muscle where estrogen improves function, in tendons and ligaments estrogen decreases stiffness, and this directly affects performance and injury rates.’



Are estrogen-related drugs new alternatives for the management of osteoarthritis? Xiao et al 2016

- ‘In summary, estrogen-related agents may exert both a direct effect on subchondral bone and direct and/or indirect effects upon the surrounding tissues, including the articular cartilage, synovium, and muscle, to name a few.
- Estrogen and SERMs may be particularly favorable for postmenopausal patients with early-stage OA or osteoporotic OA, a phenotype defined by reduced bone mineral density related to high remodeling in subchondral bone.
- At present, no single drug exists that can prevent OA progression...’

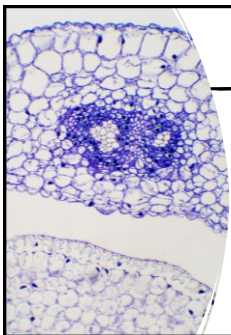


RESEARCH REPORTS

Describing Reproductive and Pelvic Floor Health in Female Former Soccer Athletes: A Preliminary Study

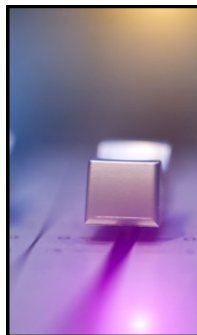
Chandran, Avinash PhD, MS^{1,2,3,4}; Nedimyer, Aliza K. MA, LAT, ATC^{2,4}; Walton, Samuel R. PhD, ATC^{2,3,4}; DeCicco, Jamie P. BS^{2,3}; Temme, Kate E. MD, CAQSM¹; Willis-Gray, Marcella MD⁵; Weight, Erienne A. PhD⁶; Kerr, Zachary Yukio PhD, MPH^{2,3,4}; Mihalik, Jason P. PhD, CAT(C), ATC^{2,3}; DeFreese, J. D. PhD^{2,3,4}; Carneiro, Kevin A. DO^{3,4}

Do athletes have to deal with menopause?



Estrogen Declines

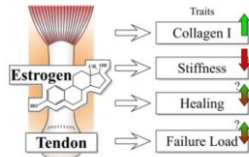
- If oestrogen has protective benefits for connective tissue tensile strength, healing and ability to take load....
- What happens when that supply declines?
- 95% of collagen in tendons is attributed to Type 1 collagen: oestrogen appears to exert a permissive effect on connective tissue and collagen regeneration and musculo-skeletal adaptations to loading and tendon stiffness.



So when we switch from estradiol to estrone...

LeBlanc et al 2017

- 'The effect of estrogen on tendon and ligament metabolism and function'
- '...For a long time estrogens have been known as a regulating factor of the metabolism in many connective tissues, like bone, muscle and cartilage'
- '...Research implies a positive effect of estrogens on tendon tissue biology and biomechanics'



- Tendons love Oestrogen

- Tendons hate change

LeBlanc et al 2018: '...The climacteric transition in particular appears to be a turning point for the prevalence of tendon related diseases, for example carpal tunnel syndrome or tenosynovitis de Quervain...'



Starlinger et al 2021: 'Risk of de novo severe carpal tunnel syndrome after bilateral oophorectomy: a population-based cohort study'



Watt 2018

- '...At the time of menopause, musculoskeletal pain is reported by more than half of women.'
- Presentation with joint pain in women is greatest between 45 and 55 years of age...Women are approximately twice as likely to have joint pain and stiffness around the time or after the menopause than their premenopausal counterparts, when adjusted for age.'

Ozcivit et al 2021

'Can fibromyalgia be considered a characteristic symptom of climacterium?'

Specifically For Muscles & Tendons? But also...

Adipokines vs Myokines

O'Sullivan 2018

'The Fifty-Year-Old Shoulder: Anatomy of a complex problem'

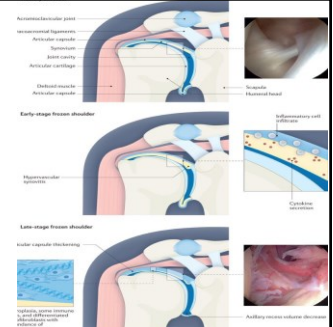
What also exacerbates shoulder pain?

Stress, sleep interruption, blood sugar/metabolic issues, new activity...

Interview on Youtube w/Eoin O'Conaire, shoulder specialist physio

Rotator Cuff

- The role of estrogen and progesterone receptors in the rotator cuff disease: a retrospective cohort study
- Longo et al 2021



Does MHT help? Maybe...

- Poster presentation at NAMS in 2022 by Wittstein & Ford
- This retrospective cohort study analyzed medical records of nearly 2,000 post-menopausal women between the ages of 45 and 60 and who presented with shoulder pain, stiffness and adhesive capsulitis.
- Among the women in the study, only 3.95% of those who had received hormone therapy were diagnosed with the shoulder condition, compared to 7.65% of women who had not received MHT. The differences were not statistically significant, (likely due to the sample size), but the researchers said the findings should drive further investigation...

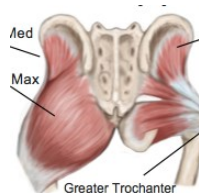


Why Do Happy Hips Matter At Menopause?

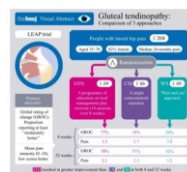
- Striated urethral sphincter changes: after the age of 35, we lose 2% SUS...every year! (Ferruchini et al 2003)
- Effects of hip mobility & strength on bladder control - Jordre et al 2014
- Gluteal tendinopathy - 1 in 4 women in their 50'S

Gluteal tendinopathy

- Affects 1 in 4 women in their 50's
- 4 times as common in women
- Incidence peaks at perimenopause
- Pain often as severe as/ misdiagnosed as osteoarthritis
- Formerly known as trochanteric bursitis



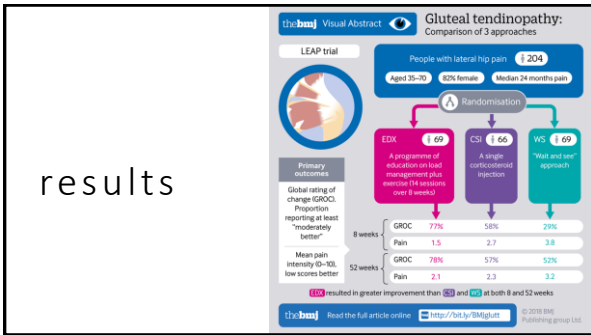
The leap trial, mellor et al 2018



The study compared education and exercise with corticosteroid injection (CSI) and a 'wait and see' group.

Participants aged 35 to 70 were included who had lateral hip pain for more than three months with a pain score of at least 4 out of 10 and a clinical diagnosis of GT was reached using a combination of clinical testing and MRI results.

In total 204 subjects were studied, 167 of which were women and the mean age was 54.8 years.



LEAP Protocol

Avoid adduction

Isometric abduction – supine and standing – ‘think about doing side splits’

Bridging: feet close to hips 3 seconds up, 3 seconds there, 3 seconds down

Progress from double leg to offset to single leg

Squats: double leg with good alignment and control (‘bottom back’)

Progress from double to offset to single leg

Step Ups

Frontal plane loading – controlled side stepping then adding resistance eg Reformer

Skating – bilateral abduction

Does Menopausal Hormone Therapy, Exercise, or Both Improve Pain and Function in Postmenopausal Women With Greater Trochanteric Pain Syndrome?

- Greater trochanteric pain syndrome (GTPS) is a debilitating chronic condition, most prevalent in postmenopausal women.
- A positive association between high estrogen levels and tendon health may exist, and postmenopausal women have reduced estrogen.
- Menopausal hormone therapy (MHT) may reduce the incidence of tendon abnormality, particularly when combined with exercise and if BMI <25**
- Cowan et al 2022

Pelvic Health DEPENDS on Hip Health

‘Relationship Between Sexual Function and Pelvic Floor and Hip Muscle Strength in Women With Stress Urinary Incontinence’ Hwang et al 2021 Conclusion: The female sexual function could be related to not only PFM functions but also hip muscle strength in women with SUI

‘Hip and Pelvic Floor Muscle Strength in Women With and Without Urgency and Frequency-Predominant Lower Urinary Tract Symptoms’ (Foster et al 2021) Conclusion: ‘...Women with UF-LUTS had weaker hip external rotator and abductor muscles, but similar pelvic floor strength and endurance compared with controls...’

Sarcopenia

Sarcopenia, the degenerative loss of muscle mass and strength is an issue of the aging human body, affecting up to 30% of the population above the age of 60

While both sexes are afflicted with this problem, it is known to increase particularly in females during the peri-menopause

Studies have demonstrated a positive effect of HRT on the contractile muscle-force in postmenopausal individuals as well as a preventing effect on postmenopausal Sarcopenia

(Greising et al 2009: Hormone therapy and skeletal muscle strength: a meta-analysis)

David Propst, bjsm blog

- ‘Sarcopenia and the SARC-F: Is it the most important screening that you aren’t doing?’
- BJSM Blog Jan 24

SARCOPENIA SCREENING


What is Sarcopenia?
It is a progressive muscle disorder involving accelerated loss of muscle mass and function commonly associated with aging but can be influenced by inactivity, hormonal changes, and chronic diseases.

Why Screen?
Sarcopenia has a prevalence rate of approximately 10% among individuals aged 60 and above. Ignoring sarcopenia can lead to reduced quality of life, impaired function, and increased mortality rates.

How to Screen
Screen by using the SARC-F. A positive score of 4 or greater leads to measurements of muscle strength (grip) and function (gait speed).

Table 1. Resistance Exercise Training Recommendations for Sarcopenia Prevention and Treatment

Training Component	Recommendations
Frequency	1-3 times per week, ideally twice
Target Muscle Groups	Whole body, including upper body push (e.g., chest press), pull (e.g., seated row), and a lower body movement (e.g., leg press)
Repetitions per Set	8-12, with gradual increases in intensity (weight x repetitions)
Sets per Muscle Group	1-3 sets per muscle group or alternatively, a single set of 10-20 repetitions to voluntary muscle failure
Rest Periods	2-3 minutes between sets, 3-5 minutes between exercises
Total Workout Duration	Under an hour



The SARC-F

- S** Strength: How much difficulty do you have in lifting and carrying 10 pounds? None 0, Some 1, A lot or unable 2
- A** Assistance in walking: How much difficulty do you have walking across a room? None 0, Some 1, A lot, use aids, or unable 2
- R** Rise from a chair: How much difficulty do you have transferring from a chair or bed? None 0, Some 1, A lot or unable without help 2
- C** Climb stairs: How much difficulty do you have climbing a flight of 10 stairs? None 0, Some 1, A lot or unable 2
- F** Falls: How many times have you fallen in the past year? None 0, Less than 3 falls 1, 4 or more falls 2

Managing Sarcopenia

- Primary treatment is properly dosed resistance exercise training
- Optimal protein intake is beneficial
- Creatine monohydrate and correcting vitamin D deficiency may also be beneficial

David Probst, PhD




Sarcopenia can affect all muscles...



Strength Training at Menopause:


- 📈 can improve insulin sensitivity
- 😴 can improve mood & sleep
- 📉 can decrease weight gain
- 🧠 improves brain function via Irisin
- 🔥 can decrease hot flashes (by up to 44%!)
- 🦵 leg & grip strength linked to brain function
- 🦴 improves bone density & resilience



PERIMENOPAUSE:

- TIME
- TO PUT
- THE FE IN
- FEMALE
- HEALTH

Berin et al 2019: strength Training decreased hot flashes by 44%...



So...does MHT help?

- Dam et al 2021 : The use of transdermal ET enhanced the increase in muscle mass in response to 12 weeks of progressive resistance training in early postmenopausal women.


Randomized Controlled Trial > Eur J Appl Physiol. 2023 Mar;123(3):667-681.
doi: 10.1007/s00421-022-05093-0. Epub 2022 Dec 31.

Effects of transdermal estrogen therapy on satellite cell number and molecular markers for muscle hypertrophy in response to resistance training in early postmenopausal women

Tine Vlist Dam¹, Line Barner Dalgaard¹, Frank Ted Johansen¹, Mads Sigsgaard Bengtsen², Maikke Mose³, Katrine Meyer Lauritsen⁴, Claus H Grauholt^{2,3}, Mette Hansen⁴



But doesn't lifting heavy make POP worse?



Symptoms of pelvic organ prolapse in women who lift heavy weights for exercise: a cross-sectional survey

Lori B Forner et al. Int Urogynecol J. 2020 Aug.

WHY AREN'T WOMEN EXERCISING AT MIDLIFE?

This is why!

- 1 in 4 reported anal incontinence as a barrier
- 1 in 3 reported prolapse symptoms as a barrier
- 1 in 2 reported urinary incontinence as a barrier

JOURNAL ARTICLE

Pelvic Floor Symptoms Are an Overlooked Barrier to Exercise Participation: A Cross-Sectional Online Survey of 4556 Women Who Are Symptomatic

Get access

Jodie G Dakic, PT , Jill Cook, PT, PhD, Jean Hay-Smith, PhD, Kuan-Yin Lin, PT, PhD, Christina Ekengen, PT, PhD, Helena C Frawley, PT, PhD

Physical Therapy, Volume 102, Issue 3, March 2022, p228284,

<https://doi.org/10.1093/ptj/pzab284>

Published: 22 December 2021 Article history



And: mental health

Review > J Affect Disord. 2024 Jul 15:357-126-133. doi: 10.1016/j.jad.2024.04.041. Epub 2024 Apr 18.

The risk of depression in the menopausal stages: A systematic review and meta-analysis

Yasmeen Badawy ¹, Aimee Spector ², Zishi Li ³, Roopal Desai ³

Affiliations + expand

PMID: 38642901 DOI: 10.1016/j.jad.2024.04.041

Free article

Mental Health

- For many women, menopause transition can be a period of emotional and physical changes, with different menopausal stages associated with varied risk for depressive symptoms and diagnosis.
- Perimenopausal women were found to be at a significantly higher risk for depressive symptoms and diagnoses, compared to premenopausal women

• Why?

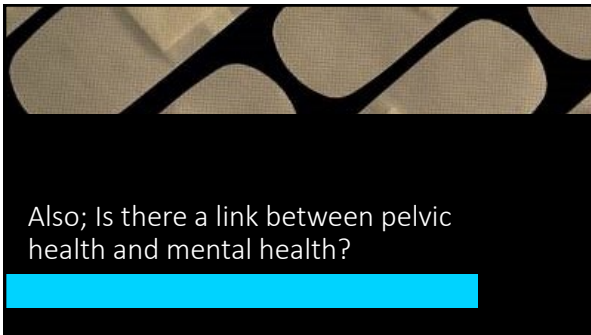
What can/must/should/would we do?

- Screening – DASS
- Multi-disciplinary Approach
- Pittsburgh Insomnia Inventory
- What's in our (evidence based) toolbox?

Exercise & Mental Health

- The size of these benefits was comparable to, and slightly larger than, the benefits of medications and psychotherapy.
- Singh et al 2023





Also; Is there a link between pelvic health and mental health?



Bone Health

Post menopausal Osteoporosis

Postmenopausal osteoporosis is a systemic bone metabolism disorder affecting 30% of women over the age of 50

The disease is characterised by progressive bone loss and subsequent increase in the risk of fractures

Among postmenopausal women the lifetime risk of hip fracture is 15-20% and the risk of any osteoporotic fracture is about 50%


Oestrogen deficiency has been shown to change bone metabolism via promoting bone resorption and decreasing bone formation

2021 NAMS position statement

- **“all fractures, except those of the face, skull, hands, and feet, are associated with low bone mineral density and future fracture risk, irrespective of association with trauma.”**
- W. D. Leslie, J. T. Schousboe, S. N. Morin, et al. Osteoporosis International. 2020;31. Fracture risk following high-trauma versus low-trauma fracture: a registry-based cohort study
- Dawn C. Mackey, MSc; Li-Yung Lui, MA, MS; Peggy M. Cawthon, PhD; et al. High-Trauma Fractures and Low Bone Mineral Density in Older Women and Men. JAMA. 2007;298.
- Management of osteoporosis in postmenopausal women: the 2021 position statement of The North American Menopause Society. Menopause: The Journal of The North American Menopause Society 2021;28

75% of all hip fractures occur in women

- The lifetime risk of hip fracture is 1 in 6, compared with a 1 in 9 risk of a diagnosis of breast cancer.
- A **50 year old** woman has a 2.8% risk of death related to hip fracture during her remaining lifetime, equivalent to her risk of death from breast cancer and 4 times higher than that from endometrial cancer.



Can we stop the first fracture?

- ‘It is reported that hip fractures could be reduced by 30% with an increase in peak bone mass of 10%. Bone mass accretion starts from childhood and continues into adulthood, and peak bone mass can be achieved in the mid-twenties for spine and hip while other bones, such as the radius, reach a peak at age of 40 years. After that, bone mass normally declines...’
- **‘Healthy bone requires continuous re-modelling which is pivotal for bone density maintenance’**
- ‘Primary osteoporosis in postmenopausal women’ Meng-Xia Ji and Qi Yu (2015)

REDS

- Know Your History
- Track your cycles
- Look for Masqueraders

Figure 1

Impact

Hip fractures significantly impact quality of life and are often associated with chronic pain, reduced mobility, disability, and an increasing degree of dependence.

The mortality rate in the first 12 months after hip fracture is 20% or higher.

50% of persons experiencing a hip fracture will be unable to walk without assistance, and 25% will require long-term or nursing home care.

Assessment & Diagnosis

DEXA: T Score of minus 2.5

FRAX (fracture risk assessment tool)
WHO

Age, weight, gender, height, smoking, alcohol use, parental hip fractures

Computes the chance of a # over ten years

If risk > 3% for hip or risk > 20% for other major fractures, then Rx recommended

Would you know how to screen for NoF?

- Hop test
- Fulcrum test
- Patellar Pubic Percussion test

Could Yoga & Pilates Play A Role In Bone Health?

Yes!

Lu et al 2016: 'Twelve-Minute Daily Yoga Regimen Reverses Osteoporotic Bone Loss'

2016

2021

Fernandez-Rodriguez et al 2021: 'Effectiveness of Pilates and Yoga to improve bone density in adult women: A systematic review and meta-analysis'

Ng et al 2021 'Feasibility, safety and effectiveness of a pilot 16-week home-based, impact exercise intervention in postmenopausal women with low bone mineral density'

- Methods: Fifty community-dwelling postmenopausal women with BMD T-scores < - 1.0 participated in 16 weeks of home-based impact exercise **progressively increasing to 50 multi-directional unilateral hops on each leg daily.**
- Femoral neck areal BMD increased...Trabecular volumetric BMD increased at the total hip and femoral neck increased...Distal tibia total vBMD increased and cortical cross-sectional area increased Chair stand and stair climb time improved by 2.34 ± 1.88 s respectively.
- **Conclusion: A 16-week home-based, impact exercise was feasible and may be effective in improving femoral neck areal BMD, total hip and distal tibial vBMD and physical function in postmenopausal women.**

Brooke-Wavell et al 2022: 'Strong, steady and straight: UK consensus statement on physical activity and exercise for osteoporosis'

- **Key recommendations are that people with osteoporosis should undertake**
- (1) resistance and impact exercise to maximise bone strength
- (2) activities to improve strength and balance to reduce falls
- (3) spinal extension exercise to improve posture and potentially reduce risk of falls and vertebral fractures.

'...For safety, we recommend avoiding postures involving a high degree of spinal flexion during exercise or daily life.

- People with vertebral fracture or multiple low trauma fractures should usually exercise only up to an impact equivalent to brisk walking.
- Those at risk of falls should start with targeted strength and balance training.
- Vertebral fracture symptoms may benefit from exercise to reduce pain, improve mobility and quality of life, ideally with specialist advice to encourage return to normal activities. There is little evidence that physical activity is associated with significant harm, and the benefits, in general, outweigh the risks...'

Brooke-Wavell et al 2022

- **Strong:** physical activity and exercise to benefit bone strength;
- **Steady:** physical activity and exercise to prevent falls;
- **Straight:** physical activity and exercise to reduce risk of vertebral fracture, improve posture and manage symptoms after vertebral fracture

Is exercise safe if you have osteoporosis?

- '...the majority of observational or non-randomised studies in people with osteoporosis did not report adverse events, apart from muscle soreness and joint discomfort. **There were some reports of vertebral fractures associated with end-range, sustained, repeated or loaded flexion exercises, including sit-ups and some yoga positions involving extreme spinal flexion...**...there was **no evidence of symptomatic vertebral fracture in association with impact exercise or moderate to high-intensity muscle-strengthening exercise.** Closely supervised high-intensity resistance and impact training in osteoporotic men and women was associated with few adverse effects and no vertebral fractures

Resistance exercises involving major muscle groups should be used to load skeletal sites at risk of osteoporotic fracture, such as the spine, proximal femur and forearm

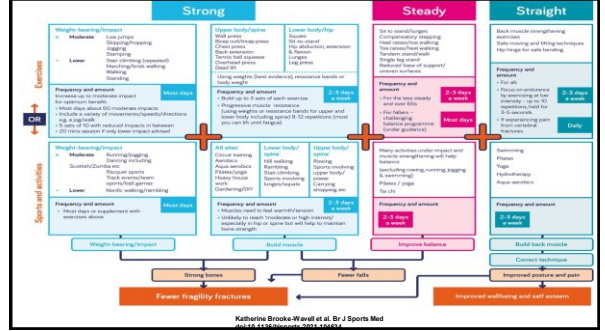
This may be achieved through one exercise each for legs, arms, chest, shoulders and back using exercise bands, weights or body weight, or eight exercises targeting major muscle groups of the hip and spine, including:

- weighted lunges
- hip abduction/adduction
- knee extension/flexion
- plantar-dorsiflexion
- back extension
- reverse chest fly
- abdominal exercises (while avoiding loaded spinal flexion).

The latter recommendation could be replaced by fewer compound movements, such as squats and dead lifts

EESG 2022

- To enable activity, EESG consensus was that other sports or leisure activities that might promote muscle strength should also be encouraged, such as circuit training, rowing, Pilates or yoga, stair climbing, sit to stands, heavy housework or gardening and carrying shopping, although repeated or end-range flexion should be avoided in these activities



EESG 2022: Recommendations to reduce risk of vertebral fracture, improve posture and manage symptoms of vertebral fracture

A positive and reassuring approach is recommended to reduce fear, enhance confidence and control 'how to' rather than 'don't do', especially as most people with osteoporosis are unlikely to experience a vertebral fracture during these activities.

Exercises to improve muscle strength in the back are recommended to improve posture and support the spine. Aim for exercises repeated 3–5 times and held for 3–5 s at least twice a week

'Think straight' – a straight upper back (and keeping the neck in line with the spine) is the key principle for all movements that involve bending and lifting'

However, recognising the natural curves in the back, flexibility and function remain important and should be encouraged.

Safe lifting techniques are recommended rather than instructions such as 'don't lift' or 'only lift up to a specific weight'.

The 'hip hinge' is a simple technique for safe bending that facilitates this and can be practised and integrated into all day-to-day movements.

Always move in a smooth, controlled way within a comfortable range. Rotation (twisting) movements should be safe if performed smoothly and comfortably.

Precautions:

Movements or exercise that involve sustained, repeated or end-range flexion should be modified or avoided.

Any exercise that causes the back to curve excessively especially with an added load should be modified or avoided.

As a precaution, alternatives to exercises such as the 'roll down' and 'curl up' in Pilates should be considered



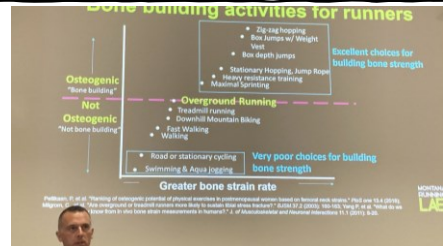
Is running good (or bad) for bones?

Horga et al 2021

- 'Runners who completed a 4 month beginner training program before their first marathon run, plus the race itself, showed no damage on 3T mri scans'



Yes...for the 1st 50 steps!

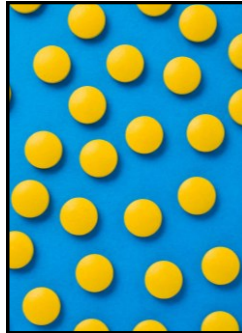


WHAT CAN WE DO?

LIFT WEIGHTS,
AVOID SUGAR,
OPTIMISE SLEEP,
EAT ENOUGH
PROTEIN!



Is there a magic pill?



Where else do we need to pay attention?

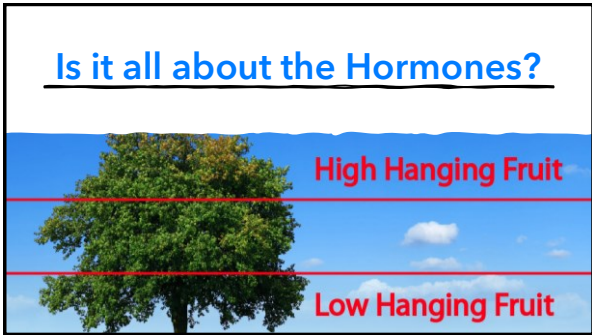
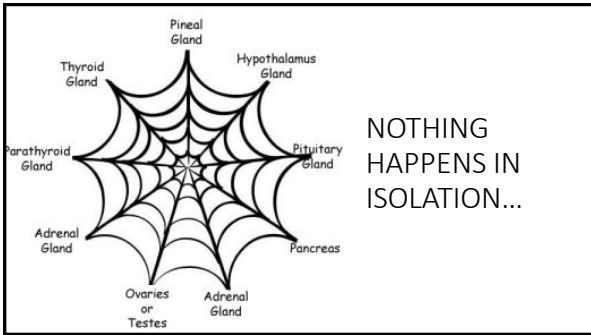
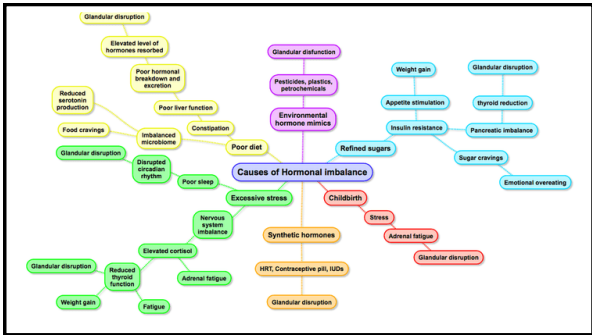
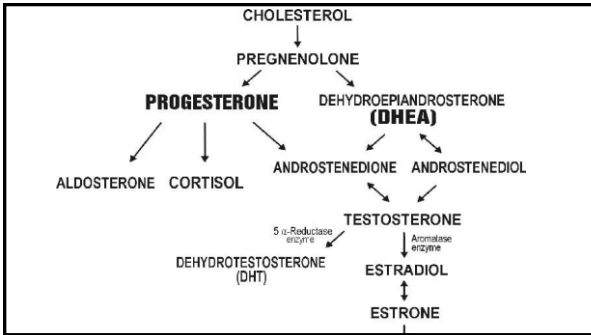
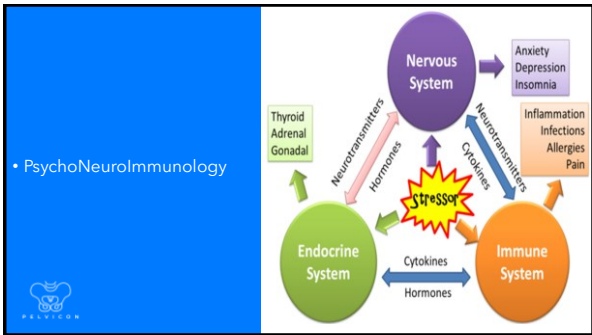
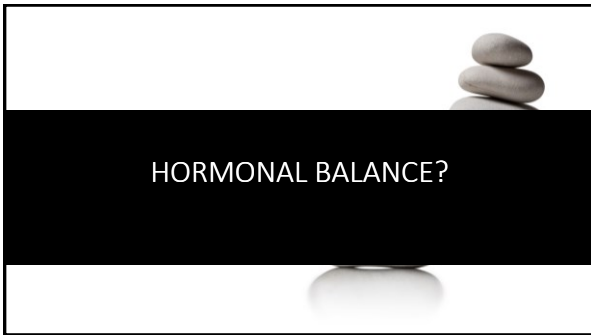


But...do hormones work in isolation?

The germ is nothing, the terroir is everything! - Louis Pasteur

HORMONES





Strategies for Hormonal Health



Are we truly biopsychosocial?

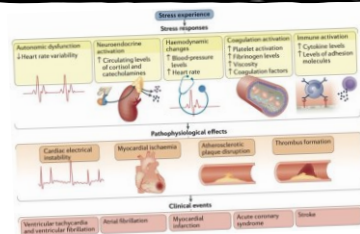


Factors such as physical activity, good sleep, social participation, optimism, positive affect & healthy eating are well known factors that optimise neuroimmune health



Instead of seeing people as a mechanical entity needing to be fixed, we must see people with rich, varied life experiences that shapes their daily interaction with the world they find themselves in

Stress Management at menopause:



Kivimaki et al 2017: 'Effects of stress on the development and progression of cardiovascular disease'

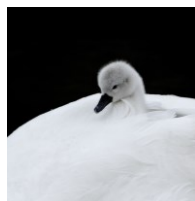
Brief structured respiration practices enhance mood and reduce physiological arousal
 Heidi Thore Dalen^{1,2}, Eric Kim¹, Sara-Louise Stanger¹, Lisa Hwang¹, Amy Neuman¹, Paul M. Slone¹, Steven R. Gruber¹, David Spiegel¹, Andrew Steptoe^{1,3}
 Affiliations: 1. Stanford University, 2. University of California, 3. University of Exeter
 PMID: 28222210 DOI: 10.1093/mon/mon017

- In the general population, adults with work stress or private-life stress have a 1.1-fold to 1.5-fold increased risk of incident coronary heart disease and stroke
- Stress in adulthood has an important role as a disease trigger in individuals with high atherosclerotic plaque burden and as a determinant of prognosis and outcomes in those with pre-existing cardiovascular or cerebrovascular disease
- European guidelines for cardiovascular disease prevention acknowledge stress as a clinically meaningful risk factor in individuals with a high overall risk of cardiovascular disease or with established cardiovascular disease



Midlife is the key...

- SWAN Study: Midlife is the time to address risk factors for heart & cognitive health
- High blood sugar
- Diabetes/Insulin Resistance
- Belly Fat
- If your Heart Age Score > Actual Age
- (<https://www.nhs.uk/conditions/nhs-health-check/check-your-heart-age-tool/>)

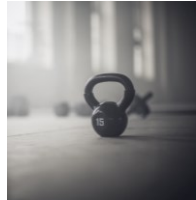


Is there life after menopause?



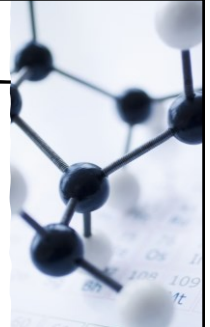
Goh et al 2021: 'Targeting the molecular & cellular pillars of human aging with exercise'

- A single session of aerobic exercise changes the expression of ~ 9800 molecular analytes in systemic circulation that span transcripts, proteins, metabolites, and lipid classes
- Such wide-spanning effects of exercise have routinely led to its credence as a polypill, as it confers pleiotropic benefits in multiple organ systems
- In fact, exercise is as effective as drug interventions in the secondary prevention of coronary heart disease (CHD), and even outperforms standard metformin treatment in preventing type 2 diabetes



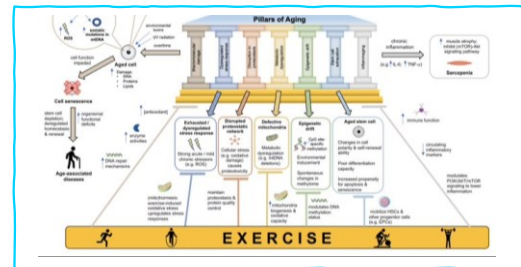
Goh et al: 'Targeting the molecular & cellular pillars of human aging with exercise'

- When extrapolated to the population level, epidemiological studies support the role of regular exercise in improving human longevity, as indicated by several outcomes such as **frailty, physical function, falls, muscle strength and power, cognition, and mortality**



Goh et al 2021: 'Targeting the molecular & cellular pillars of human aging with exercise'

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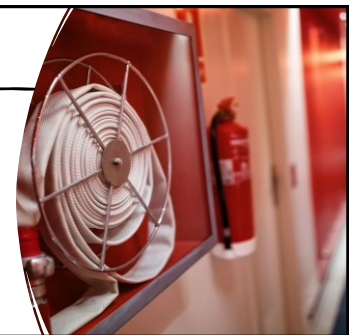
Hunter 2021

- "...The CBT focus is primarily on vasomotor symptoms (VMS) but it also targets stress, low mood and sleep problems. CBT is a brief therapy (four to six sessions) that is theory- and evidence-based; it is acceptable to women and effectively reduces the impact of VMS, improves sleep and has benefits to quality of life...



But also

- Paced breathing with Prolonged Exhale/Hum - add shoulder shrugs
- Place hands on belly - what zone are you breathing in?
- Elevate the pelvis (when possible)



Is there a magic pill for menopause?



But also:

> Menopause. 2022 Sep 20. doi: 10.1097/GME.0000000000002062. Online ahead of print.

The impact of foot massage given to postmenopausal women on anxiety, fatigue, and sleep: a randomized-controlled trial

Nilay Gökbulut ¹, Emine İbici Akça ², Çiğdem Karakayalı Ay ³

Affiliations + expand

PMID: 36126237 DOI: 10.1097/GME.0000000000002062

Gokbulut et al 2022

- Study results determined that foot massage applied during menopause increases the average daily sleep duration—**as much as an hour per day**—and reduces women's fatigue and anxiety levels.



Questions?!

'When women take care of their health, they become their own best friend' Dr Maya Angelou



“Menopause Mastery” Michelle Lyons

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